

**Remarks/Arguments:**

Claims 25-41 are pending. With this amendment, the applicant amends claims 25, 28, 30, 36 and 41 to more clearly identify the claimed subject matter. No new matter has been added.

**I. The Office Action**

The Office Action rejects claims 25-41 under 35 U.S.C. § 103(a) as obvious in view of Murachi et al. (U.S. 5,746,989) when taken together with the JP 62-117620 ("JP '620"). Specifically, the Examiner contends that because the process of JP '620 is broadly directed to removing nitrogen oxides from any nitrogen oxide containing gas, it is *prima facie* obvious for one of ordinary skill in the art to appreciate that any known or conventional regeneration method could be employed to regenerate the adsorbent in Murachi et al.

The Office Action also rejects claims 25-35 and 41 under 35 U.S.C. § 112, second paragraph, for failing to particularly point out and distinctly claim the subject matter of applicant's invention. More specifically, the Examiner has indicated claims 25, 28, 30, and 41 contain improper language.

**II. Definiteness of Claim Language**

The applicant has amended claims 25 and 36 to more clearly recite the chemical reaction of NO<sub>x</sub> to N<sub>2</sub>. The applicant appreciates the Examiner's suggestion of amendments to claims 25, 23, 30 and 41. The applicant has therefore amended these claims consistent with the Examiner's suggestions.

**III. Non-obviousness**

The applicant submits that the obviousness rejection is flawed for two reasons: there is no motivation to combine the references either expressly or impliedly contained in the prior art or from knowledge generally available to one of ordinary skill in the art; and even if the

references were properly combined and read in their entirety, the references would still not teach each and every limitation of the claimed invention.

**A. There is no motivation to combine the references either expressly or impliedly contained in the prior art or from knowledge generally available to one of ordinary skill in the art.**

The Office Action fails to set forth a proper *prima facie* case of obviousness. As cited in the M.P.E.P. § 2142, the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990). Moreover, a statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made" because the references relied upon teach that all aspects of the claimed invention were individually known in the art is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (Bd. Pat. App. & Inter. 1993).

The Office Action has not provided any motivation to combine Murachi et al. with JP '620. The Office Action makes unsupported conclusions in forming its *prima facie* case of obviousness stating, JP '620 is "broadly directed to removing nitrogen oxides from any nitrogen containing gas," and "one of ordinary skill in the art would appreciate that any known or conventional regeneration method could be employed." No objective reasons to combine the references have been provided to support the conclusions made in these statements. Because these statements are not further supported with some objective reason to combine the teachings of the references, the applicant submits that the Office Action fails to correctly set forth a *prima facie* case of obviousness. The applicant respectfully requests reconsideration on this point, unless the rejection is overcome for another reason, such as that set forth in Section B below.

- B. Even if the references were properly combined and read in their entirety, the references would still not teach each and every limitation of the claimed invention.**

Amended claim 25 recites in part:

. . . a catalyst system effective to promote reactions of hydrocarbons (HC) and CO with O<sub>2</sub> to H<sub>2</sub>O and CO<sub>2</sub> and to convert NO<sub>x</sub> to N<sub>2</sub>, wherein said catalyst system is at least one of: (1) associated with the absorber; or (2) located downstream of the absorber.

Process claim 36 similarly recites in part:

. . . (v) regenerating the absorbent intermittently by injecting a NO<sub>x</sub>-specific reactant upstream of the absorbent; and (vi) at least during step (v), contacting a catalyst system effective to promote reactions of HC and CO with O<sub>2</sub> to H<sub>2</sub>O and CO<sub>2</sub> and to convert NO<sub>x</sub> to N<sub>2</sub> with the gas product of step (v).

As acknowledged by the Office Action at page 3, Murachi et al. fails to disclose:

... nitrogen oxide[s] absorbent should be regenerated intermittently by injecting a nitrogen oxide-specific reactant upstream of the absorbent, and contacting the catalyst system effective to promote reactions of hydrocarbons and carbon monoxide with oxygen to water and carbon dioxide and to react nitrogen oxides to nitrogen with the gas product of such regeneration.

To form the obviousness rejection, the Office Action states:

JP '620 discloses a method for removing nitrogen oxides from nitrogen oxides containing gas by oxidation absorption of the nitrogen oxides in exhaust gas by contacting a catalyst in the presence of oxygen for removing nitrogen oxides and regeneration of the oxidation absorption capability of the catalyst by stopping the exhaust gas supply to the catalyst and processing the catalyst by contacting a gaseous reducer when the efficiency of the nitrogen oxides absorption by the catalyst has decreased.

The Office Action then concludes that because JP '620 is broadly directed to removing nitrogen oxides from any nitrogen oxide containing gas, one of ordinary skill would appreciate that such a method could be employed in Murachi et al.

The M.P.E.P. § 2143 states that the prior art reference (or references when combined) must teach or suggest all the claim limitations to support an obviousness rejection. The applicant submits that JP '620 does not teach what Murachi et al. fails to disclose. First, there is no specific teaching in either Murachi et al. (as acknowledged by the Office Action) or JP '620 that the catalyst system is "as least one of (1) associated with the absorber; or (2) located downstream of the absorber," as recited in claim 25. JP '620 states that the primary characteristic of the invention is that NO<sub>x</sub> in exhaust gas is oxidized and absorbed by a catalyst in the presence of oxygen (page 6, 2<sup>nd</sup> full paragraph). In the practical Example 1 of JP '620, the system has catalyst A and catalyst B, but no absorber. Even if catalysts A or B were considered an absorber, JP '620 does not position the catalyst so that one is upstream of the other as in claim 25. In contrast, JP '620 teaches that the catalysts are run in parallel to each other (see page 7, 4<sup>th</sup> full paragraph).

Similarly, claim 36 specifies that the gas which is placed into contact with the catalyst system is "the gas product of step (v)," namely the gas that passed through the absorbent. Thus, as claimed, the process of the present invention specifies a catalyst system which receives the gas that passed through the absorbent. On the other hand, JP '620 does not position the catalyst in series with other catalyst (see Figure 1, reference numerals 3 and 6). As mentioned above, JP '620 teaches that the catalysts are run in parallel to each other.

## **V. Conclusion**

Without at least one objective reason to combine Murachi et al. with JP '620, the Office Action *prima facie* case of obviousness is in error. Nonetheless, even if Murachi et al. and JP '620 were combined, the resulting combination would not teach each and every limitation of claims 25 and 36.

For the foregoing reasons, the applicant respectfully requests reconsideration of the pending Office Action rejections. Finally, the applicant's undersigned representatives request a telephonic interview with the Examiner if such action will expedite the prosecution of the application or if the Examiner has any suggestions or questions concerning the application or the present Response. If the claims of the application are not believed to be in full condition for allowance, for any reason, the applicants respectfully request the constructive assistance and suggestions of the Examiner in drafting one or more acceptable claims pursuant to MPEP § 707.07(j) or in making constructive suggestions pursuant to MPEP § 706.03 so that the application can be placed in allowable condition as soon as possible and without the need for further proceedings.

Respectfully submitted,



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